

Remarks/Arguments

Claims 1-29 remain in this application. To more correctly describe phenomenon of bright edges caused by fringing electrical fields having undesirable orthogonal field components, applicants have substituted the term "disclination" for declination in the specification and in claims 17 and 26. Applicants have added no new matter to the specification.

Before proceeding to address the rejection, applicants will briefly summarize their invention to better assist the examiner in appreciating the difference between applicants' invention and the art of record. Applicants' invention, as recited in pending claims 1-29, concerns a technique for reducing sparkle artifacts in a LCOS imager. Such artifacts are attributable to adjacent less bright pixels with unequal brightness, resulting in fringing electrical fields that have a component orthogonal to the desired field. The sparkle problem is time invariant and is unrelated to motion in the image. To overcome the sparkle problem, applicants modify the video signal to be displayed by decomposing the luminance signal of a picture into a higher brightness level signal and a lower brightness level signal. The lower brightness level signal is slew rate limited to limit the difference in brightness levels between adjacent pixels. The higher brightness level signal is delayed in time to match the processing delay through the slew rate limiter. The delay matched higher brightness level signal and the slew rate limited lower brightness level signal are then combined to form a modified luminance signal. The demarcation between higher and lower brightness levels is adjustable and positive and negative slew rates are adjustable. The adjustments are advantageously independent of one another, and are preferably related to transitions between lower gain and higher gain portions of the gamma table.

The subject matter of the instant application (sparkle reduction) is related to applicants' co-pending applications Serial No. 09/803, 249 and 09/803,485, which are currently under rejection by the United States Patent and Trademark Office. Accompanying this application is a Supplemental Information Disclosure Statement that lists art cited in each of the other applications.

35 U.S.C. 102(e) Rejection of Claims 1-29

The examiner has rejected claims 1-29 under 35 U.S.C. 102(e) as anticipated by U.S. Patent 6,359,663, issued March 19, 2002, in the name of Koen Gadeyne et al. (hereinafter, "the

Gadeyene et al. patent”), from an application filed December 14, 1999. Applicants respectfully traverse this rejection.

The Gadeyne et al. patent concerns a technique for addressing the problem of luminance response time differences between CRT and LCD displays, that result in luminance jumps in a displayed picture before and after movement of the image. In other words, Gadeyne et al. are concerned with the transition from different brightness levels (darker-to-lighter and lighter-to-darker) from **picture-to-picture**. To overcome this problem, Gadeyne et al. convert an incoming (first) video signal into a second video signal modified to have different luminance response times for display on a different type of display device such as a LCD type display. The conversion causes the luminance time response of a picture element of the image, resulting from a change of the first video signal from a first amplitude value to a second amplitude value, to be substantially equal in shape and amplitude but reversed (i.e., inverted) in slope, as compared to the luminance time response of the same or another picture element of the image resulting from a change of the first video signal from the second amplitude value to the first amplitude value. The luminance time responses can be made substantially equal to predefined luminance time responses.

The Gadeyne et al. patent concerns a solution to a problem completely different than the problem overcome by applicants’ claimed invention. As discussed above, the Gadeyne et al. patent provides a technique for removing luminance jumps that result from image movement. In contrast, applicants’ claimed technique serves to reduce the problem of sparkle artifacts, a problem that remains time invariant, and in fact has no bearing on the luminance response time. Thus, LCOS imagers tend to suffer from sparkle artifacts whether or not movement exists in the image.

The Gadeyne et al. patent does not anticipate applicants’ claims 1-29. Processing an incoming video signal to yield a second signal having the same amplitude and shape but an inverted slope, as taught by Gadeyne et al. will presumably adjust the luminance response time and thus reduce the problem of flicker. However, there is no disclosure in Gadeyne et al that such processing will reduce the incidence of sparkle, i.e., the problem of dark pixels appearing too bright in the same image.

A careful review of the disclosure of Gadeyne et al. reveals that this cited reference simply fails to anticipate applicants’ invention. Each of applicants’ independent claims 1, 11 and

21 recite the feature of:

② { dividing a video signal for a picture into a higher brightness level signal and a lower brightness level signal

The Gadeyne et al. patent simply does not teach this feature. The examiner's reliance on Col. 2, lines 45-67 of the Gadeyne et al. patent provides no such support. At best, this cited portion of the Gadeyne et al. patent suggests processing an incoming video signal to yield a second signal a having a different luminance response time, not two separate signals having different brightness levels. Therefore, Gadeyne et al. does not anticipate claims 1, 11 and 21. Further, the Gadeyne et al. patent would not anticipate claims 2-10, 12-20 and 22-29, which depend from, and incorporate by reference the features of, claims 1, 11 and 21, respectively.

Further, the Gadeyne et al. patent does not anticipate applicants' claims 1-29 for another reason. Applicants' independent claims 1, 11, and 21 also recite the feature of:

(3) slew rate limiting said lower brightness level signal.

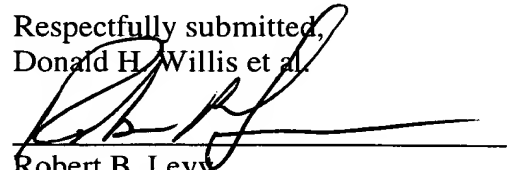
The Gadeyne et al. patent fails to disclose or suggest this feature. At best, the Gadeyne et al. patent teaches the desirability of converting the incoming video signal into a second video signal so that the faster luminance response of a picture element to a change of the first video signal is slowed down in order to match the luminance response in time and amplitude to the known slower luminance response of the same or another picture element for the opposite change of the first video signal. As described at Col. 8, lines 62-67 and Col. 9, lines 1-22, the process of changing the luminance response time is an iterative process and involves subtracting a predicted luminance value from the actual value to yield a value Δ whose value determines whether the luminance should increase in the next period and by how much.

The process described in the Gadeyne et al. patent for changing the luminance value does not constitute the same feature as slew rate limiting said lower brightness level signal. First, as discussed previously, Gadeyne et al. does not separate the incoming signal into a high and low brightness component, and thus, there does not exist and lower brightness level signal form slew rate limiting. Assuming arguendo that Gadeyne et al. did provide a lower brightness level signal, the process which Gadeyne et al. change luminance from picture to picture does not constitute slew rate limiting, a process for limiting the maximum rate of change of the lower brightness level signal component for a step change input. For this reason, Gadeyne et al. would not anticipate applicants' independent claims 1, 11 and 21, nor any of the claims that depend therefrom. Applicants' respectfully request withdrawal of the 35 U.S.C. 102(e) rejection of claims 1-29.

Conclusion

Based on the foregoing remarks, applicants deem this application in condition for allowance and solicit such action. If, however, the Examiner is of the opinion that such action cannot be taken, the Examiner is invited to contact the applicant's attorney at (609) 734-6820, so that a mutually convenient date and time for a telephonic interview may be scheduled. No fee is believed due. However, if a fee is due, please charge the additional fee to Deposit Account 07-0832.

Respectfully submitted,
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